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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,824	10/26/2000	Omprakash S. Sarmaru	VELCP003	7360

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EXAMINER

DO, CHAT C

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/698,824

Applicant(s)

SARMARU ET AL.

Examiner

Chat C. Do

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-10,12,14,16-19,22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5-7, 12, 14, and 16-18 is/are rejected.
- 7) ☒ Claim(s) 8-10,19,22 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is responsive to Amendment filed 05/18/2005.
2. Claims 1, 3, 5-10, 12, 14, 16-19, and 22-23 are pending in this application. Claims 1 and 12 are independent claims. In Amendment, claims 2, 4, 11, 13, 15, and 20-21 are cancelled.

This Office Action is made final.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3, 5-7, 12, 14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Long (U.S. 6,240,141).

Re claim 1, Long discloses in Figures 6A-6B, 7A-7D, and 8 an apparatus for processing input sample sets of at least one discrete multi-tone (DMT) modulated communication channel (e.g. abstract lines 3-6) and the apparatus comprising: an input memory storing (e.g. 42 and 44 in Figure 8 and set of data in i and k direction in Figure 6A) each input sample set of a two-dimensional array rows (e.g. 0, 4, 8....60 in Figure 6A) and columns of samples (e.g. 0, 1, 2, 3 in Figure 6A); an output memory (e.g. Figure

6B) storing two-dimensional arrays of rows (e.g. $X(1,k)$ in Figure 6B) and columns of coefficients (e.g. $X(i,1)$ in Figure 6B) resulting from a corresponding one of a time-to-frequency domain transformation and a frequency-to-time domain transformation (e.g. col. 5 lines 54-59) of each input sample set and a two-dimensional (e.g. $N1$ and $N2$) Fourier transform circuit coupled between the input (e.g. table 1 of $X(N)$ in Figure 6A) and output memory (e.g. table 2 of $X(N)$ in Figure 6B) to perform the corresponding transformation of the input sample set and having: row transform components (e.g. 22 in Figure 6A) including a Radix- R butterfly having " R " inputs and " R " output nodes; and the row transform components generating partial row transforms (e.g. output of 22 in Figure 6A) limited to solutions to a single unsolved one of the " R " output nodes of the Radix- R butterfly on each of the " R " iterations through ordered sets of samples from each input sample set (e.g. Figure 6A and col. 7 lines 35-50 since the data are loaded in column-wise, the $N1$ PT IFFT can be started immediate after the first column of $N2$ PT IFFT available); and column transform components (e.g. 24 in Figure 6A) coupled to the row transform components and configure to generate complete column transforms (e.g. output to the Figure 6B) from the partial row transforms generated by the row transform components prior to a completion of the " R " iterations through each input sample set by the row transform components (e.g. 22 and 24 process simultaneously); thereby to reduce an interval required to transform each successive input sample set.

Re claim 3, Long further discloses in Figures 6A-6B, 7A-7D, and 8 the input memory (e.g. table 1 of $X(N)$ in Figure 6A) further comprises: " R " separate memories each storing contiguous blocks of columns of the two-dimensional array or rows (e.g.

$X(1,k)$) and columns (e.g. $X(i,1)$) of samples of each input sample set and each of the "R" separate memories coupled to a corresponding one of the "R" inputs of the Radix-R butterfly (e.g. couple to 22).

Re claim 5, Long discloses in Figures 6A-6B, 7A-7D, and 8 the at least one discrete multi-tone (e.g. abstract) comprises a first DMT communication channel associated communications on a first subscriber line (e.g. col. 1 lines 50-55) and a second DMT communication channel associated with communications on a second subscriber line (e.g. col. 1 lines 50-55) and the first and second DMT communication channels difference from one another in a number of samples over sample set (e.g. col. 1 lines 50-55 wherein each user has difference carrier frequencies).

Re claim 6, Long discloses in Figures 6A-6B, 7A-7D, and 8 the row transform components begin processing the next sample set before the column transform components have completed all the column transforms on a prior sample set (e.g. Figure 6A as pipeline).

Re claim 7, Long discloses in Figures 6A-6B, 7A-7D, and 8 the ordered set of samples processed by the row transform components further comprise samples separated from one another in each row of the input memory by a spacing substantially equal to a number of columns in the input sample array divided by "R" (e.g. in table 1 of $X(N)$ in Figure 6A, the first butterfly data operation is separated from the next butterfly data operation by 1 as N/R).

Re claim 12, it is a method claim of claim 1. Thus, claim 12 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 14, it is a method claim of claim 3. Thus, claim 14 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 16, it is a method claim of claim 5. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 17, it is a method claim of claim 6. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Re claim 18, it is a method claim of claim 7. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Allowable Subject Matter

5. Claims 8-10, 19, and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed 05/18/2005 have been fully considered but they are not persuasive.

a. The applicant argues in page 10 last paragraph that the drawing objection and the objection under 35 U.S.C. 112 first paragraph were not withdrawn as discussed in the interview dated May 2nd 2005.

The examiner respectfully submits that these objections were made in the previous Final Office action dated 12/18/2003 and had been withdrawn. As

indicated in the last Non-Final Office action, there was no drawing objection nor the objection under 35 U.S.C. 112 first paragraph.

- b. The applicant discusses and argues in pages 11-13 for rejection under U.S.C. 112 second paragraph that definition of “the row transforms limited to solutions to a single unsolved one of the R output nodes of the Radix-R butterfly operation” is clearly cited in the specification.

Despite of current language of the limitation “the row transforms limited to solutions to a single unsolved one of the R output nodes of the Radix-R butterfly operation” but in view of applicant’s argument in pages 11-13, the examiner withdraws the rejection under U.S.C. 112 2nd paragraph and interprets the above limitation as the row transform component comprising R-iterations of radix-R butterfly wherein each R-iteration generates a transform output of R-outputs.

- c. The applicant argues in pages 13-14 for claims 1, 3, 5-7, 12, 14, and 16-18 rejected under U.S.C. 102(e) that the limitations with respect to partial row transforms and the generation of complete column transforms are not disclosed in the cited reference by Long.

The examiner respectfully submits that Figures 6 and 8 cited by Long clearly show the limitations with respect to partial row transform and the generation of the column transforms. As seen in Figure 6, the data are loaded in column-wise therefore the 2nd dimension of IFFT can be started right after the 1st dimension of

IFFT computed due to data arrangement in matrix in Figure 6A and due to the shared memory in Figure 8.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

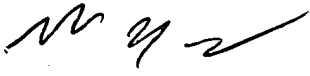
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

August 22, 2005


WEI Y. ZHEN
PRIMARY EXAMINER